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Building insulation industry  
in Canada, 1930, and Low tempera-  
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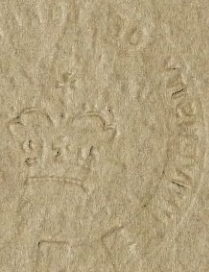
Canada. National Development Bureau

Government  
Publication

**BUILDING INSULATION INDUSTRY IN CANADA, 1930  
AND  
LOW TEMPERATURE HEAT INSULATION INDUSTRY  
IN CANADA, 1929**

**NATIONAL DEVELOPMENT BUREAU  
DEPARTMENT OF THE INTERIOR  
OTTAWA, CANADA**





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THE BUILDING INSULATION INDUSTRY  
IN CANADA, 1930

The purpose of this report is to direct attention to the rapidly expanding markets for insulating materials used in the building industry. The manufacture of these insulators is an outstanding example of conservation in Canada as practically all the raw materials employed---wood waste, waste paper, cattle hair, eel grass, flax straw, mica trimmings, and scrap gypsum board---are waste or semi-waste materials.

The National Development Bureau gratefully acknowledges the assistance of Canadian manufacturers and importers, the Canadian Pacific and Canadian National Railways and several companies in the United States exporting insulating materials to Canada, whose generous co-operation has made possible the preparation of the within reports.





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## THE BUILDING INSULATION INDUSTRY IN CANADA, 1930

This report deals mainly with the insulation of all heated buildings such as residences, hotels, churches, hospitals, office buildings and factories, but also embraces certain non-heated types including barns, and warehouses where perishable products are stored.

First in order of importance is the heat and sound proofing of new houses and the modernizing of old houses, which employs from 65 to 70 per cent of all the insulation used in Canada.

Next in order is the insulation of three types of structures:-

1. Residential buildings,- apartment houses, clubs, etc.
2. Business and public buildings,- offices, stores, auditoriums, theatres, etc.
3. Industrial buildings,- manufacturing plants, power houses, etc.

Among these three types the remaining consumption of insulation is about evenly divided.

The industry is nation-wide in extent, insulation being employed from Vancouver to Sydney and from the most southerly parts of the Dominion to Baffin Island in the far north.

Canada is particularly fortunate in having adequate supplies of the raw materials entering into the manufacture of building insulators. There is an abundance of wood waste and other vegetable fibres such as flax and wheat straw, eel grass and fibrous peat. Nor are materials of mineral origin lacking, for gypsum, limestone and diatomite deposits are wide-spread and of ample proportions and large quantities of slag are available at various strategic points.







## Canadian Consumption

The year 1930, notably the latter half, proved an extremely difficult one to the construction industry generally, yet the building insulation industry came through in very satisfactory manner even registering new high levels in the rigid board section.

### Production

The growing demand for building insulators in Canada and the increasing popularity of these products abroad is reflected in a corresponding expansion in their domestic manufacture. In 1926 there were four Canadian plants in production; now there are eleven with at least four more in prospect.

The 1930 output of rigid wallboards was 45,800,000 square feet, an increase of 36,100,000 square feet in five years. In that time the Canadian requirements supplied by domestic manufacturers has advanced from 63 per cent to 86 per cent.

The production of semi-rigid boards, blocks and blankets has also shown satisfactory growth in the face of a 1930 decrease in consumption, the 2,500,000 square feet output being an increase of 200,000 square feet over 1929 figures and an increase in the Canadian requirements supplied from domestic sources of from 27 per cent to 38 per cent.

Excluding the 1,200,000 cubic feet of eel grass produced for export purposes, the percentage of Canadian filler consumption of domestic origin increased from 51 per cent in 1929 to 62 per cent in 1930, although the actual volume of production fell off from 950,000 cubic feet to 800,000 cubic feet.

Note: - All square measure data are expressed in half-inch thickness; data on fillers in cubic feet of insulation applied.







### Exports

In the rigid board section further gains of 4,500,000 square feet were shown during the year over the then maximum figure of 10,400,000 square feet registered in 1929. An export of 250,000 square feet of semi-rigid board, block and blankets was made. Substantial shipments of eel grass were made from the Maritimes to U.S.A. for insulation purposes.

The principal countries to which exports were made included the British Isles, Germany, South Africa, New Zealand, Australia, China, The Netherlands, Singapore and Malaya. An effort is also being made to extend export markets in other countries, notably such South American countries as Brazil and the Argentine, also in Africa, Greece and Turkey.

### Imports

Imports of all building insulators were down during 1930, the declines from 1929 figures being: rigid wallboards 3,100,000 square feet, blocks and blankets 2,450,000 square feet, and fillers 400,000 cubic feet.

### Value

The value of building insulation consumed in Canada during 1930 (as sold to builders and householders) roughly approximated \$2,450,000 divided as follows: rigid wallboards \$1,800,000; boards, blocks and blankets \$300,000; fillers \$350,000. The corresponding value in 1929 was: rigid boards \$1,600,000; boards, blocks and blankets \$450,000; fillers \$550,000.

The production value of building insulators in 1930, using the same basis of computation was: rigid boards \$2,300,000; boards, blocks and blankets \$125,000; fillers \$300,000, a total of \$2,725,000.







## Conclusions

In the field of building insulators the rigid board types have continued to show notable advances. As shown in the following table, the domestic consumption of such wallboards (Ten Test, Donnacona, Insul Board, Celotex, Beaver Insulating Board, Insulite, Maftex, Masonite, etc.) has more than tripled in four years, reaching a total of 36,000,000 square feet in 1930 as against a consumption of 10,900,000 square feet in 1927, 22,100,000 square feet in 1928 and 32,200,000 square feet in 1929. A feature in the last two years has been the growth in the consumption of wallboard lath and other special products.

### Rigid Wallboards

	1927 sq. ft. <sup>1</sup>	1928 sq. ft. <sup>1</sup>	1929 sq. ft. <sup>1</sup>	1930 sq. ft. <sup>1</sup>
Domestic consumption <sup>2</sup>	10,900,000	22,100,000	32,200,000	36,000,000
Domestic production.	11,900,000	21,100,000	34,400,000	45,800,000
Imports .....	5,000,000	6,000,000	8,200,000	5,100,000
Exports .....	6,000,000	5,000,000	10,400,000	14,900,000

### Semi-Rigid Boards, Blocks and Blankets

Domestic consumption <sup>3</sup>	9,350,000	12,175,000	8,500,000	6,000,000
Domestic production. <sup>3</sup>	925,000	1,700,000	2,300,000	2,500,000
Imports .....	8,425,000	10,475,000	6,200,000	3,750,000
Exports .....	---	---	---	250,000

### Fillers

	cu. ft.	cu. ft.	cu. ft.	cu. ft.
Domestic consumption <sup>4</sup>	950,000	1,200,000	1,850,000	1,300,000
Domestic production. <sup>4</sup>	485,000	710,000	950,000	2,000,000
Imports .....	465,000	500,000	900,000	500,000
Exports <sup>5</sup> .....	---	---	---	1,200,000

### Explanatory Notes

- 1 In terms of half-inch thickness.
- 2 Includes considerable quantities of board used for sound proofing and acoustical purposes.
- 3 Amended figures for 1929 owing to the transfer of 2,850,000 sq. ft. of material to the cold storage section.
- 4 Does not include the quantities of various insulating fillers such as sawdust, planer shavings, etc. produced and used locally for packing the inter-stud, joist, and rafter spaces of buildings.
- 5 Includes for the first time exports of baled eel grass for insulation purposes.







The consumption of semi-rigid board, block and blanket insulators (Seal-O-Felt, corkboard, Fibrofelt, Flaxlinum, Houseline and other hair felts, Linofelt, Cabot's Quilt, etc.) in 1930 was the lowest since 1926, totalling only 6,000,000 square feet, a drop of 2,500,000 square feet from 1929 figures.

The utilization of insulating fillers (Insulex, Thermofill, mineral wool, granulated cork, eel grass, etc.) in 1930, at 1,300,000 cubic feet, was 550,000 cubic feet under 1929 figures, although greater than that of any other preceding year. Over 75 per cent of the fillers used were of the manufactured type such as Insulex, mineral wool and granulated cork, the balance receiving simple preparatory treatment only such as curing, washing and baling.







CANADIAN MANUFACTURERS

Rigid Wallboards

International Fibre Board, Ltd.; mills, Gatineau, Que., and Midland, Ont.; sales office, Gatineau, Que.

"Ten/Test"

Standard insulation board	- $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ " and 1" thick, 4' wide, the $\frac{1}{2}$ " material from 4' - 12' long; other thicknesses 6' - 12' long.
Rib-face sheathing	- $\frac{5}{8}$ " thick, 4' wide, 8' - 12' long.
Notch board plaster base	- $\frac{1}{2}$ ", $\frac{5}{8}$ " and 1" thick, 16" wide, 32" long.
Asular block (Acousti A)	- $\frac{1}{2}$ " and 1" thick - various dimensions.

"Pyro/Test"

Fire resistant board	-standard board and lath sizes.
----------------------	---------------------------------

"Termite/Test"

Ant-proof board	- standard board and lath sizes.
-----------------	----------------------------------

"Hydro/Test"

Moisture resistant industrial board - 1' wide, 4' long , various thicknesses.

"Acousti/Test"

Acoustical board	- (sizes to be announced)
------------------	---------------------------

Price Brothers & Co., Ltd.; mill, Donnacona, Que.; H.O. Quebec, P.Q.

"Donnacona"

Standard Insulation board	- $\frac{1}{2}$ ", $\frac{5}{8}$ ", 1" and 2" thick, 4' wide, 8' - 12' long.
Roof board	- $\frac{1}{2}$ ", $\frac{5}{8}$ ", 1" and 2" thick; 2' wide, 5' long.
Industrial board	- $\frac{1}{2}$ " thick, 3' wide, 6' long.
Plaster lath	- $\frac{1}{2}$ ", $\frac{5}{8}$ " and 1" thick, 18" wide, 4' long.

Building Products, Ltd.; mill, Portneuf, Que.; H.O., Box 2529 Montreal, Que.

"Insul Board"

Standard insulation board	- $\frac{7}{16}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", $\frac{7}{8}$ " and 1" thick, 4' wide, 8', 9', 10' and 12' long.
Roof board	- $\frac{7}{16}$ ", $\frac{5}{8}$ ", $\frac{7}{8}$ " and 1" thick, 2' wide, 5' long.
Lath	- $\frac{7}{16}$ " and $\frac{5}{8}$ " thick, 18" wide, 4' long.

Certain-teed Products Corporation of Canada, Ltd.; mill and H.O. Thorold, Ont.

Formerly produced "Beaver" insulation board; now preparing to market a board made by another company.

Note: All the above mentioned boards are composed of wood fibre, utilizing varying amounts of mill waste, edgings, coarse pulp screenings, sawdust, shavings, waste paper and unbleached sulphite pulp.





### Semi-Rigid Boards

Flax Fibre Products, Ltd.; mill, Selkirk, Man.; H.O., Winnipeg, Man.

#### "Seal-O-Felt"

- |                     |   |
|---------------------|---|
| Standard flax board | - flanged sheets, $\frac{1}{2}$ " thick, $16\frac{1}{2}$ " and $24\frac{1}{2}$ " wide; 8', 9' and 10' long. |
| Flat sheets         | - $\frac{3}{8}$ " thick, 32" wide; 8', 9' and 10' long.   |
| Roof insulation     | - $\frac{1}{2}$ " thick, 32" wide, 4' long.   |

### Blankets

Canadian Johns-Manville Co., Ltd.; mill, St. Johns, Que.; H.O. Toronto, Ont.

#### "Houseline"

- |                  |  |
|------------------|--|
| Hairfelt blanket | - $\frac{3}{8}$ " thick, 3' wide, packed in bales of 250 sq. ft. |
|------------------|--|

"Salamander" and other hairfelts.

Riverbank Manufacturing Co., Ltd.; mill, Trenton, N.S.; H.O. New Glasgow, N.S.

#### "Building Blanket"

- |                      |  |
|----------------------|--|
| Eel grass insulation | - single ply $\frac{1}{3}$ " thick, double ply $\frac{1}{2}$ " thick, triple ply $\frac{2}{3}$ " thick; all plies 3' wide, packed in bales of 250 sq. ft.; covering of plain building, asbestos or waterproof paper. |
|----------------------|--|

Guildfords, Ltd.; mill and H.O., Halifax, N.S.

#### "Guildfords"

- |                              |   |
|------------------------------|---|
| quilted eel grass insulation | - single ply $\frac{1}{3}$ " thick, double ply $\frac{1}{2}$ " thick, triple ply $\frac{2}{3}$ " thick; all plies 3' wide, packed in bales of 250 sq. ft. |
|------------------------------|---|

### Fillers

Gypsum, Lime and Alabastine, Canada, Ltd.; H.O. Paris, Ont.

#### "Insulex"

- |            |  |
|------------|--|
| Dry filler | - in 50 lb. bags, weight about 20 lbs. per cu. ft.   |
| Wet filler | - a powder, in 50 lb. bags; to be mixed with water on the job, weight installed, 15 lbs. per cu. ft. |

Western Gypsum Products, Ltd.; mill and H.O. Winnipeg, Man.

#### "Eventemp"

- |                   |  |
|-------------------|--|
| Dry gypsum filler | - in 40 lb. bags, weight about 20 lbs. per cu. ft. |
|-------------------|--|

Albert Manufacturing Co., a division of Canadian Gypsum Co., Ltd.; mill at Hillsborough, N.B.; H.O., Toronto, Ont.

#### "Thermofill"

- |                   |  |
|-------------------|--|
| Dry gypsum filler | - in 50 lb. bags, weight about 20 lbs. per cu. ft. |
|-------------------|--|

#### Eel Grass

There are several producers of eel grass, mainly in Nova Scotia, New Brunswick and Quebec. Most consumers in Ontario and Quebec secure their supplies from A. Roy, Isle Verte, Quebec.

Note: Such companies as Canadian Consolidated Felt Co., Ltd., Kitchener, Ont., and Toronto Asphalt Roofing Manufacturing Co., Ltd., Toronto, Ont., also manufacture insulating felts.





## RECENT ACTIVITIES

Outstanding among the developments which took place in the industry during the past year are three new installations for the production of building insulators and the commercial operation of two plants which previously had been on a semi-experimental basis.

The companies installing new plants were:

The Albert Manufacturing Co., at Hillsborough, N.B.  
Guildford's Limited, at Halifax, N.S.  
Western Gypsum Products, Ltd., at Winnipeg, Man.

The new companies entering full commercial production during the year were:

The Donnacona Mill of Price Bros. & Co., at Donnacona, Que.  
The Riverbank Manufacturing Co., at Trenton, N.S.

The Solomite Co. of Canada of Regina, Sask., who intend to produce a pressed, wire-bound, straw board, are still in the experimental stages.

## PROPOSED DEVELOPMENTS

The Sidney Roofing and Paper Co., Ltd., Victoria, B.C., are planning the erection of a mill to produce an insulating wallboard from shingle mill waste of the district.

The Acimite Insulating Corporation, Ltd., of Toronto, are reported to be planning the erection of a plant at Belleville to make an insulating board from mica waste and other materials.

The Celotex Co. of Chicago have stated their intention of erecting a plant in Canada during 1931.

The Canadian Gypsum Co. of Toronto will manufacture "Thermofill", a gypsum filler, at a plant soon to be erected at Willow Grove, near Hamilton.

The production of an insulating board and other manufactured materials from fibrous peat is under consideration. Two concerns, one in Edmonton and one in Duluth, are reported to be interested in the development of such a project in Manitoba, and some talk is also heard of a similar development in New Brunswick.

Other insulation possibilities in Canada are, the establishment of an additional wood wallboard plant, the manufacture of mineral wool from slag or rock, and the manufacture of a rigid wallboard from wheat straw.





MANUFACTURERS IN UNITED STATES

Some of the leading manufacturers of building insulation in the United States are:

The Celotex Company, Chicago, Ill.; "Celotex" standard building, roof, industrial and refrigeration boards, acousti-board and lath; Canadian representative: Alexander Murray & Co., Ltd., Montreal.

Johns-Manville, New York, N.Y.; mineral wool and "Celite" fillers, "Rock Cork," mineral wool blocks, "J-M" wood wallboard; Canadian Company: Canadian John-Manville Co., Ltd., Toronto.

Armstrong Cork & Insulation Co., Lancaster, Pa.; "Armstrong" corkboard and granulated cork; Canadian Company: Armstrong Cork and Insulation Co., Ltd., Toronto.

Union Fibre Company, Inc., Winona, Minn.; rock wool filler, "Lith" blocks, "Fibrofelt" flexible flax board, "Linofelt" blanket.

Samuel Cabot, Inc., Boston, Mass.; "Cabot's" eelgrass quilt; Principal Canadian representatives: F.A. Gillis Co., Halifax; W.H. Thorne & Co., Saint John N.B.; G.I. Lachance, Quebec; P.N. Soden & Co., Montreal; Seymour & Co., Montreal; W.A. Rankin, Ltd., Ottawa; John Lindsay Co., Toronto; McCurdy Supply Company, Winnipeg.

Flaxlinum Insulating Company, St. Paul, Minn.; "Flaxlinum" flexible flax board.

Masonite Corporation, Chicago, Ill.; "Masonite" wood wallboard.

MacAndrews & Forbes Company, New York, N.Y.; "Maftex" wallboard (made from spent licorice root); Canadian representative: National Gypsum Co., Hamilton, Ont.

Wood Conversion Company, Cloquet, Minn.; "Balsam-Wool" wood-fibre blanket, "Nu-Wood" wood wallboard; Canadian representative: Rice Lewis & Son, Ltd., Toronto.

The Insulite Company, Minneapolis, Minn.; "Insulite" wood wallboard.

Stewart Inso Board Corporation, St. Joseph, Mo.; "Inso" wheat straw wallboard.

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The United States Gypsum Co., Chicago, Ill.; "Thermofill" gypsum filler; "Weatherwood" and "Red Top" hardwood wallboards.

Wood-Fibre Board Corporation, New York, N.Y.; "Arborite" wood wallboard.

The Upson Company, Lockport, N.Y.; "Upson Blue-Stripe" blanket insulation; Canadian representative: Walker Lumber Co., Toronto.

United States Mineral Wool Company, New York, N.Y.; "United States" mineral wool filler.

General Insulating & Manufacturing Co., Alexandria, Ind.; "Gimco" rock wool filler, blankets, flexible sheets and coverings.

Thermax Corporation, Seattle, Wash.; "Thermax" fireproof wood wallboard.

Dry-Zero Corporation, Chicago, Ill.; "Dry-Zero" ceiba fibre insulation; Canadian office, 465 Parliament St., Toronto.

Sprayo-Flake Co., Milwaukee, Wis.; "Sprayo-Flake" sprayed filler insulation.

#### INSULATION TRENDS

As stated in the 1929 report, the present trend in Canada is definitely toward thicker insulation. In the rigid wallboards where the standard thickness has been 7/16" for years, practically all manufacturers are producing and recommending the thicker boards -  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", 1" and even 2". The manufacturers of flexible boards and blankets are marketing thicker products, and greater depths of fillers are now being used in buildings. There is, of course, an economic limit, beyond which added insulation does not justify the increased cost, but we are, in most instances, still far from that limit in Canada.





## RESEARCH

Insulation research in Canada may be divided into two classes, namely, commercial research carried out by manufacturers, which deals mainly with refinements in process, improvements in existing products and the development of new ones, and pure research, which is more particularly concerned with such matters as the determination of heat conductivities, physical characteristics of insulators, the behaviour of insulators under varying climatic conditions, investigations of wall sections and test houses, and the standardization of equipment and testing methods. Acoustical research is carried on under both classes.

In the field of commercial research some notable achievements have been made during the past year. One well known Canadian concern producing wood-fibre wallboards has developed three new products--an ant-proof board designed to withstand the ravages of the termite and other insect pests in tropical countries, an industrial board for roof and other construction specially treated to resist moisture, and a fire-resisting board. The perfecting of these products is a particularly credible accomplishment in view of the fact that the chemicals used for impregnation have not increased the rate of heat flow to any appreciable degree.

Another important Canadian producer of wood wallboards has installed a well manned and equipped research laboratory which has in the past year not only developed a new lath and improved the quality of its other board products, but has also devoted considerable research to the possible production of other waste wood products.

Still another concern has expended considerable study in the development of new binders for its laminated boards.

A well known company producing gypsum insulators maintains an extensive laboratory where several improvements in process and product have been made during the past year. Several other companies have improved the quality of their products and developed new insulators,





while considerable research has been carried out in an endeavour to produce insulators from such waste materials as peat, wheat straw and mica trimmings.

Acoustical research was carried out by several manufacturers and at least two new products evolved.

In the second field of research considerable progress was made during 1930. The experimental investigations on the thermal conductivities of various insulating materials, carried out for the then Tariff Board by the National Research Council in testing laboratories at Toronto, Queen's, McGill and Saskatchewan Universities, was completed and a report covering the findings is now in course of preparation.

The National Research Council during the year installed a laboratory for making heat conductivity measurements by the hot plate method, the machine having an effective working surface 12" x 12".

Considerable experimental work on heat conductivity was carried out from time to time at the laboratories of the above-mentioned universities, and at two of them, Toronto and McGill, acoustical research was undertaken.

#### DISSEMINATION OF INFORMATION

The insulation manufacturers are engaged in spreading the gospel of insulation through the medium of extensive magazine and newspaper advertising, and by the wholesale distribution of descriptive literature. One company, International Fibreboard Ltd., has gone a step further and formed an "Insulation Institute", an organization designed to disseminate information on insulation by such means as lectures, movies, bulletins, articles, etc.

The National Development Bureau has in course of preparation for the Dominion Fuel Board several bulletins on insulation and kindred subjects. Two publications in this series have been issued and are



available for distribution, namely, "Why You Should Insulate Your Home" and "Humidity in House Heating". A third, entitled "The Insulation of New and Old Houses", is now under way.

Various reports and articles of a technical nature will be issued from time to time by the National Research Council and by universities and other research organizations as opportunities arise.

#### MARKET PROSPECTS FOR 1931.

From present indications this year's sales of building insulation should exceed those of 1930 by a fair margin. That this assumption is a reasonable one is demonstrated by the fact that during 1930 the building insulation industry held its own, even registering a gain in the rigid board division, in the face of a serious depression in the building trades; a depression marked by a decrease in construction from the 1929 figures of over one hundred million dollars in the types of structures for which insulating materials are or can be used. This is clear evidence that the percentage of both new and old buildings in which insulation is being employed is increasing rapidly.

Therefore with building during 1931 predicted to be not much, ~~more~~, below 1930 levels, with a wider and improved range of building insulators available, with expanding foreign markets, and with increasing amounts of special insulating materials/<sup>in use</sup>for acoustical purposes, the prospects for increased business in the industry are distinctly encouraging.

#### FUTURE OF THE INDUSTRY

In a country such as this with wide seasonal variations in temperature it is reasonable to expect that the utilization of building insulators to temper these variations within doors will increase rapidly, an expectation borne out by the advances of the past five years. Some idea of future possibilities may be gained by considering the fact that



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description of the situation in the country.

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there are now over 1,000,000 houses and more than 200,000 larger buildings in Canada, the insulation of only a small percentage of which would require an enormous amount of material. Add to this the annual increment of about 20,000 houses and 5,000 larger buildings (the insulation of a house consumes from 2,000 to 8,000 board-feet of insulation, or 750 to 2,000 cu. ft. of filler, larger buildings proportionately more) and some idea of the future potentialities in Canada will be realized. It is perhaps not too optimistic to predict that the utilization of building insulation will increase at least five-fold in the next ten years.





LOW TEMPERATURE INSULATION INDUSTRY  
IN CANADA, 1929

This report directs attention to the growing field for insulating materials used in the construction of buildings, cold storage warehouses, refrigeration plants, refrigerators, refrigerator cars, steel passenger cars, tank cars and street cars. In four years the Canadian consumption of such materials has more than doubled and the production has quadrupled.



## The Low Temperature Insulation Industry

The low temperature insulation field, as herein designated, covers all sections of the cold storage and refrigeration industry as well as those divisions which might quite properly be included under the heading of medium temperature insulations.

This field falls naturally into three divisions in Canada, namely:

1. Building Insulation.
2. Cold Storage and Refrigeration Insulation.
3. Special Purpose Insulation.

Of these the most important is the building insulation division, with insulation for cold storage and refrigeration purposes next in order. The special purpose division, while yet of small proportions, has great potentialities for expansion, particularly in the insulation of railway passenger cars and street cars which will not only provide greater protection from heat in summer and cold in winter, but will also afford a measure of sound proofing.

### Building Insulation

As indicated in Part 1, the insulation of buildings--- houses, hotels, apartment houses, churches, industrial buildings, etc., is now an industry of considerable proportions in Canada, consuming in 1929, 40,700,000 square feet of board and blanket insulation and 1,850,000 cubic feet of fillers, valued at \$2,600,000. Of this, 26,800,000 square feet of board and blanket insulators and 1,300,000 cubic feet of fillers were estimated to have been used in house construction, the balance in the insulation of other buildings.

Note:- All statistics are shown in terms of half-inch thickness for boards, blocks and blankets, and in cubic feet for the fillers.





BUILDING CONTRACTS AWARDED IN CANADA  
(McLean's Building Reports)

1930

1929

1928

	<u>No.</u>	<u>Value</u> \$	<u>No.</u>	<u>Value</u> \$	<u>No.</u>	<u>Value</u> \$
Residences....	20,095	77,961,000	24,922	106,374,000	18,900	102,446,000
Apartments....	321	15,330,000	352	22,527,000	495	36,720,000
Churches.....	250	7,266,000	300	8,868,000	271	8,327,000
Public garages	675	7,050,000	831	12,915,000	839	10,889,000
Hospitals.....	94	14,636,000	118	8,984,000	112	9,596,000
Hotels & Clubs	154	13,807,000	307	20,110,000	289	15,486,000
Office buildings	334	26,530,000	510	37,475,000	246	34,121,000
Theatres.....	73	2,356,000	65	3,075,000	35	3,085,000
Warehouses....	354	17,569,000	552	29,835,000	649	31,621,000
Schools.....	472	35,080,000	525	22,483,000	504	20,907,000
Public buildings	394	16,805,000	407	19,063,000	290	8,745,000
Stores.....	1,020	10,006,000	1,569	27,354,000	1,682	27,448,000
Industrial Bldgs.	576	31,520,000	680	62,969,000	643	60,301,000
Total -	<u>24,812</u>	<u>\$275,916,000</u>	<u>31,138</u>	<u>\$382,032,000</u>	<u>24,955</u>	<u>\$272,692,000</u>

COLD STORAGE AND REFRIGERATION INSULATION

Under this heading is included insulation used for cold storage warehouses and equipment, cold rooms of all sorts, refrigerators, refrigerator cars, ice cream trucks, and refrigeration machinery installations. The amount of insulation used for these purposes in 1929 amounted to 14,420,000 square feet of board and blanket material, and 425,000 cubic feet of fillers, valued at \$1,080,000.

Cold Storage Installations

The insulation of cold storage warehouses, cold rooms, ice cream containers, visible show cases, etc., and refrigeration machinery units, constitutes an important phase of the low temperature field in Canada. Cork-board and granulated cork, imported from the United States and Spain, are the principal insulators used, with smaller quantities of Dry Zero (a new insulator made in the United States from the fibre of the Ceiba tree), Celotex and Rock Cork also utilized.

MANUFACTURERS OF REFRIGERATION EQUIPMENT  
(Partial List)

Canadian Ice Machine Co., Ltd., Toronto, Ontario.  
W.A. Drummond, Ltd., Toronto, Ontario.  
Frig-O-Matic, Ltd., Brantford, Ontario.  
Jack Frost Refrigeration, Ltd., Toronto, Ontario.  
Linde Canadian Refrigeration Co., Ltd., Montreal, Quebec.  
Universal Cooler Company of Canada, Ltd., Windsor, Ontario.  
J. & R. Weir, Ltd., Montreal, Quebec.  
York Ice Machines, Ltd., Toronto, Ontario.





Cold storage installations consumed 8,450,000 square feet of board insulation and 400,000 cubic feet of fillers in 1929.

### Refrigerators

Over 85 per cent of the insulation used in the manufacture of refrigerators is corkboard, all imported from the United States and Spain. It is still practically the only material used in electric refrigerators and continues to fill a large part of the requirements for building ordinary types of metal or wood. Other materials utilized include Ten Test, Celotex, Seal-O-Felt, granulated cork, mineral wool and strawboard.

#### REFRIGERATOR MANUFACTURERS

(Principally those reporting insulation requirements)

Barry Sheet Metal Co., Edmonton, Alberta.  
Canadian Jewett Refrigerator Co., Ltd., The, Bridgeburg, Ont.  
Davidson's, Sons, Jas., Ottawa, Ontario.  
Eureka Refrigerator Co., Ltd., Owen Sound, Ontario.  
C.P. Fabien Refrigerator Co., Ltd., Montreal, Quebec.  
General Steel Wares, Ltd., Toronto, Ontario.  
Keith Electric Refrigerator Co., Ltd., Leaside, Ontario.  
Kelvinator of Canada, Ltd., London, Ontario.  
Lee, T.W. Co., Pembroke, Ontario.  
Renfrew Refrigerator Co., Ltd., Renfrew, Ontario.  
Huddy Manufacturing Co., Ltd., Brantford, Ontario.  
Ryan Brothers, Ltd., Winnipeg, Manitoba.  
Sanderson-Harold Co., Ltd., Paris, Ontario.  
Sargent-Howard-Latourelle, Ltd., Montreal, Quebec.  
Wallace Manufacturing Co., Ltd., Sussex, New Brunswick.  
Western Utilities, Ltd., Vancouver, British Columbia.

Note- Several of the firms listed under "Refrigeration Equipment" also make refrigerators.

According to statistics collected, the amount of insulation used in the building of refrigerators during 1929 was approximately 2,000,000 square feet of board and block insulation, and 25,000 cubic feet of fillers. A decline of 1,500,000 square feet from 1926 figures is largely explained by the fact that some of the larger manufacturers of electric refrigerators have found it cheaper to import the finished box from the United States than to build it in Canada.



## Refrigerator Cars

There were 875 refrigerator cars placed in service on Canadian railways during 1929. Of these 810 were freight refrigerator cars and 65, express. Hairfelt products, mainly made in Canada, constitute the bulk of the insulation used. Other materials employed include J.-M. wallboard, Ten Test, Nu-Wood, Insul board, Seal-O-Felt, and dry pine saw dust. These cars are all manufactured in Canada. The following concerns are prominent in the construction of such equipment:

National Steel Car Corporation, Hamilton, Ontario.  
Canada Car and Foundry Company, Montreal, Quebec.  
Eastern Car Company, Ltd., New Glasgow, Nova Scotia.

### REFRIGERATOR CARS IN SERVICE ON CANADIAN RAILWAYS

<u>Railway</u>	1929 No.	1928 No.	1927 No.
Brandon, Saskatchewan and Hudson Bay	1	7	2
British Yukon.....	1	1	1
Canadian National.....	3,364	2,878	2,936
Canadian Pacific.....	4,045	3,883	3,683
Crow's Nest Southern.....	31	30	30
Greater Winnipeg Water District.....	1	1	1
Midland Railway of Manitoba.....	34	36	35
Montreal and Atlantic.....	1	1	1
Nelson and Fort Sheppard.....	2	2	2
Pacific Great Eastern.....	3	3	3
Pere Marquette.....	45	45	45
Quebec Central.....	4	4	5
# Quebec, Montreal and Southern.....	-	10	10
Roberval and Saguenay.....	1	1	1
Vancouver, Victoria and Eastern.....	46	48	47
	<u>7,579</u>	<u>6,950</u>	<u>6,802</u>

The total amount of insulation used in refrigerator cars for 1929 was approximately 5,025,000 square feet of board, block and blanket insulators. An unstated quantity of dry pine sawdust was also used.

# Figures for 1929 included with C.N.R.

Note - The discrepancy between the number of new refrigerator cars placed in service during 1929 and the increment from 1928 to 1929 as shown in the above table is accounted for by obsolete cars scrapped.





# SPECIAL PURPOSE INSULATION

This division includes the insulation used for railway passenger and tank cars, street cars and for many other miscellaneous purposes. According to very incomplete estimates, particularly with reference to tank cars, the amount of insulation consumed for special purposes during 1929 was 1,500,000 square feet of board and blanket insulators, valued at \$65,000.

## Steel Passenger Cars

The insulation of passenger coaches is a comparatively recent innovation, and one which will undoubtedly add a good deal to the comfort of railway travel - at a very low cost. In 1929 Canadian railroads are reported to have placed over 200 steel passenger cars in service, practically all insulated with Canadian hairfelt.

Other Canadian manufacturers of passenger, street and tank cars in addition to those listed under Refrigerator Cars include:

Ottawa Car Manufacturing Company, Ottawa, Ontario.  
Quebec Railway, Light and Power Company, Quebec, Quebec.  
Toronto Transportation Commission, Toronto, Ontario.  
Canadian Pacific Railway Co., Angus Shops, Montreal, Que.

## PASSENGER CARS IN SERVICE ON CANADIAN RAILWAYS

	1929 No.	1928 No.	1927 No.
British Yukon.....	21	21	21
Canadian National.....	3,506	3,468	3,433
Canadian Pacific.....	2,937	2,863	2,806
Dominion Atlantic.....	62	60	56
# Edmonton, Dunvegan & British Columbia	-	27	23
Esquimalt and Nanaimo.....	39	39	39
Pacific Great Eastern.....	29	29	29
Montreal and Atlantic.....	23	23	23
Pere Marquette.....	20	20	21
Pullman Company.....	180	178	-
Quebec Central.....	59	60	59
Quebec Railway Light & Power Co.....	22	22	22
Sydney and Louisburg.....	21	21	20
Temiskaming and Northern Ontario.....	68	68	68
Toronto, Hamilton and Buffalo.....	24	25	26
Vancouver, Victoria and Eastern.....	50	49	49
Other roads.....	150	211	237
	<u>7,250</u>	<u>7,184</u>	<u>6,922</u>

# Merged in Northern Alberta Railways, 1929.





The quantity of insulation estimated to have been employed in the construction of passenger cars during 1929 was 1,000,000 sq. ft.

#### Tank Cars

Tank cars for general service are not yet insulated as a rule, but cars for special purposes, especially those where wide changes in temperature may be detrimental to or endanger the safety of the contents, i.e., liquid chlorine, casinghead gasoline, etc., are insulated.

#### TANK CARS IN SERVICE ON CANADIAN RAILWAYS

	1929 No.	1928 No.	1927 No.
Canadian National.....	220	190	180
Canadian Pacific.....	254	255	255
Other roads.....	<u>21</u>	<u>21</u>	<u>27</u>
Total.....	<u>495</u>	<u>466</u>	<u>462</u>

Note - Above figures do not include tank cars owned by manufacturers or by tank car companies.

Statistics for tank car materials are incomplete, but the indications are that at least 250,000 square feet of insulation, nearly all corkboard, was used for insulating tank cars in 1929.

#### Street Cars

The insulation of street cars is yet in the experimental stage, but the benefits obtained by heat-proofing steel passenger cars is stimulating research in an endeavour to make street cars more comfortable, particularly in winter, to reduce the amount of power required for heating and to render them more sound proof by the use of suitable insulation. One large firm in Canada is trying out a plastic cork compound, while other manufacturers are employing the conventional hairfelt.



# PASSENGER CARS IN SERVICE ON ELECTRIC RAILROADS IN CANADA

	1928 No.	1927 No.
British Columbia.....	406	405
Calgary Municipal.....	92	88
Edmonton Radial.....	73	74
Hamilton Street.....	94	88
Hull Electric.....	44	44
London Street.....	55	59
Montreal Tramways.....	847	896
Montreal and Southern Counties....	38	39
New Brunswick Power Company.....	34	34
Niagara Falls, Park and River Div.	36	36
Niagara, St. Catherines & Toronto.	60	65
Nova Scotia Tramways & Power Co...	65	61
Ottawa Street Railway.....	195	195
Quebec Railway, Light & Power Co..	107	101
Regina Municipal.....	41	34
Sandwich, Windsor & Amherstburg...	75	61
Toronto Transportation Commission.	983	972
Toronto & York Radial.....	20	43
Winnipeg.....	347	346
Others.....	466	468
Totals.....	4,078	4,109

During 1929 about 150,000 square feet of hairfelt insulation was used in street cars, also a few hundred cubic feet of plastic insulation.

## Miscellaneous Uses

Insulating materials, most notably of the rigid wallboard type, are finding a large number of new uses. They are used for insulating storage tanks for oil and other liquids, for the manufacture of special ice cream packages and containers, for the insulation of bee hives, for sound proof partitions in offices, for quieting bowling alleys, as baffle boards and absorption panels in radios, in sound proofing radio broadcasting and recording rooms, as pads for carpets, for the insulation of aeroplane and dirigible cabins, automobile bodies, motor boats and many other uses.

Very little information is available as to the amounts of insulation employed in these miscellaneous ways. Perhaps 100,000 square feet, mainly rigid wallboard, was so used in 1929.





# STATISTICAL SUMMARY

Canadian Consumption, 1929.

Divisions	Types of Insulation			Value
	Rigid wallboard	Semi-rigid board, block, and quilt	Filler	
<u>Building</u>	Sq.ft. ( $\frac{1}{2}$ in. thickness)	Sq. ft. ( $\frac{1}{2}$ in. thickness)	Cu. ft.	\$
Houses.....	21,100,000	5,700,000	1,300,000	
Other buildings..	<u>11,100,000</u>	<u>2,800,000</u>	<u>550,000</u>	
Total.....	32,200,000	8,500,000	1,850,000	2,600,000
<u>Cold Storage and Refrigeration</u>				
Cold storage.....	5,000	8,445,000	400,000	
Refrigerators....	250,000	1,750,000	25,000	
Refrigerator cars	<u>810,000</u>	<u>4,225,000</u>	-	
Total.....	1,065,000	14,420,000	425,000	1,080,000
<u>Special Purpose</u>				
Passenger cars...	-	1,000,000	-	
Tank cars.....	25,000	225,000	-	
Street cars.....	-	150,000	-	
Other purposes...	<u>75,000</u>	<u>25,000</u>	-	
Total.....	100,000	1,400,000		65,000
Grand Total.....	33,365,000	24,320,000	2,275,000	\$3,745,000

For list of insulation manufacturers see under Building Insulation Report.

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